

Guidebook for Lithium from Formation Water (mineral brine) Exploration and Operations



Overview/Guidance

What is Lithium?

Lithium has been identified as a strategic element on the [2021 Canadian Critical Minerals List](#). While Lithium is traditionally collected from salars (evaporation ponds) in South America and hard rock mining operations, extracting Lithium from formation waters (mineral brine) shows promise as a viable industry.

This Guidebook is intended to provide a high-level overview of the requirements to conduct Lithium from formation water exploration and operations in the province. This Guidebook does not detail all the requirements but directs project proponents to the materials they should be familiar with before engaging in lithium exploration and operation activities. Interested parties should contact the Ministry of Energy and Resources should questions arise.

ER Service Desk

Energy and Resources

Phone: [855-219-9373](tel:855-219-9373) or er.servicedesk@gov.sk.ca

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1. Governing Legislation

The following Acts, Regulations and Directives govern subsurface minerals (including Lithium from formation water) exploration, development, production, and end-of-life activities in the Province of Saskatchewan.

Mineral Rights and Tenure

- [The Crown Minerals Act](#)
<https://publications.saskatchewan.ca/api/v1/products/453/formats/547/download>
- [The Subsurface Mineral Tenure Regulations](#)
<https://publications.saskatchewan.ca/api/v1/products/72797/formats/81163/download>
- [The Subsurface Mineral Conservation Regulations](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/81161/M16-1R5.pdf>

Exploration

- [The Seismic Exploration Regulations, 1999](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/2157/M16-1R2.PDF>

Production and Operations

- [The Oil and Gas Conservation Act](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/1128/O2.pdf>
- [The Oil and Gas Conservation Regulations, 2012](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/70932/O2R6.pdf>
- [The Pipeline Act, 1998](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/1146/P12-1.pdf>
- [Pipeline Administration and Licensing Regulations](#)
<https://pubsaskdev.blob.core.windows.net/pubsask-prod/115692/P12-1r2.pdf>

Directives also outline rules for the operation of wells, facilities, and pipelines from initial drilling to end of life operations. A complete list of directives can be found at:

<https://publications.saskatchewan.ca/#/categories/5568>

2. Use of the Integrated Resource Information System (IRIS)

The Integrated Resource Information System (IRIS) is an online business system that supports the development and regulation of Saskatchewan's energy and resources industry including Lithium. Through IRIS, industry completes regularly performed business activities and regulatory tasks with the province online.

Information on the use of IRIS can be found here: [IRIS](#)

3. Permits and Leases

Subsurface mineral tenure is acquired under [The Subsurface Mineral Tenure Regulations \(SMTR\)](#) through a public offering process. Subsurface minerals are defined as all natural mineral salts of boron, calcium, Lithium, magnesium, potassium, sodium, bromine, chlorine, fluorine, iodine, nitrogen, phosphorus and sulfur, and their compounds, occurring more than sixty metres below the surface of the land.

Relevant Regulations and Government of Saskatchewan website pages for subsurface minerals include the following:

- The Subsurface Mineral Tenure Regulations
 - Tenure regulations for subsurface minerals can be found at: <https://publications.saskatchewan.ca/#/products/72797>
- The Subsurface Mineral Conservation Regulations
 - Regulations regarding the drilling and development of subsurface minerals can be found at: <https://publications.saskatchewan.ca/#/products/72796>.
- Crown Subsurface Mineral Rights – Public Offering
 - This webpage includes links to historical and upcoming Subsurface Mineral Rights Public Offerings Notices and Results, which includes Lithium in formation water. <https://publications.saskatchewan.ca/#/categories/2565>
 - This page also includes links to the Public Offering schedules as well as the Subsurface Mineral Rights Public Offering Posting Request Form. <https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/crown-land-sales-dispositions-and-tenure/public-offerings>

- Subsurface dispositions.
 - For information on subsurface dispositions for potash and salt visit:
<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/mineral-exploration-and-mining/mineral-tenure/subsurface-dispositions>

Subsurface mineral permits: Designed to encourage exploration, these permits grant the rights to explore for subsurface minerals, but not to remove, produce or recover them until a lease is granted.

Please visit Part III of [The Subsurface Mineral Tenure Regulations](#). For more information regarding subsurface mineral permits.

Subsurface mineral leases: Provides the right to explore for and produce subsurface minerals. Please visit Part IV of [The Subsurface Mineral Tenure Regulations](#). For more information regarding subsurface mineral leases.

GeoPlanner

Proposed Lithium projects should consider using the GeoPlanner to review siting options.

The [GeoPlanner](#) tool is a web-enabled geo-spatial planning and decision tool that identifies base, site sensitive features from multiple ministries and agencies data, to assist with pre-planning and development of oil and gas and other commodities. It allows users to view and map their proposed project and generate a report that lists potential areas of concern to be addressed or that may require additional approval(s) or other land uses requiring provincial government approvals.

For more information on GeoPlanner, please visit this link:

[GeoPlanner - Saskatchewan Ministry of Energy and Resources](#)

<https://gisappl.saskatchewan.ca/Html5Ext/Index.html?viewer=GeoPlanner>

4. Licensing Requirements

To apply for a well licence, log into [IRIS](#) and complete the well licence application process. Well licence applications are approved by the Ministry of Energy and Resources; however, they may be subject to review by the Ministry of Environment and the Ministry of Agriculture. All applications and supporting documentation required for all three ministries are submitted through the Integrated Resource Information System (IRIS).

An authorization and establishment of a project in IRIS may be required before applying for a well licence and a facility licence if constructing and operating a lithium development that is no

longer exploratory. A Lithium Brine Project is a project respecting the production of natural (formation) brine, storing and processing of the brine, the recovery of Lithium, and the disposal of the spent brine at a licensed facility or well or associated site. For information on an application associated to assignment of a Lithium Brine Project email the request to ER Service Desk. If a well is to explore for Lithium, application and authorization is not required.

For information on licensing of associated flow lines and pipelines please refer to the: <https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/pipeline-licensing>

To obtain the license for pipeline associated with production of Lithium, please refer to PNG034 page:

To obtain the licence for the pipeline associated with production of Lithium, please refer to [Directive PNG034 Saskatchewan Pipeline Code:](https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/pipeline-licensing) <https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/pipeline-licensing>

Flowline and pipeline reviews by the Ministry of Environment and Ministry of Agriculture are required independent of the IRIS application.

The following documents and information from the Ministry of Environment may also be required with your licence application:

- Checklist for Private Lands
- Oil and Gas Proposal
- Conservation Data Center Search
- Pre-Disturbance Site Assessment
- Wet Land mitigation
- Native Vegetation mitigation
- Species of Concern mitigation

Additional information on the Saskatchewan Ministry of Environment assessment process is here: <https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/environmental-assessment/does-my-project-need-an-environmental-assessment>

Lithium Facility

A lithium facility may need to meet the requirements of:

- [Directive PNG001 Facility Licence Requirements.](https://publications.saskatchewan.ca/#/products/76261)

- [Directive 36 Venting and Flaring Requirements.](https://publications.saskatchewan.ca/#/products/103751)
- [Directive S-01 Saskatchewan Upstream Petroleum Industry Storage.](https://publications.saskatchewan.ca/#/products/106215)
- And any facility related sections in [The Oil and Gas Conservation Act](#) and [The Oil and Gas Conservation Regulations, 2012](#), not covered by the above Directives.

Contact the ER Service Desk early in the life of the project to receive guidance with respect to lithium facility requirements.

The Technical Safety Authority of Saskatchewan – Boiler and Pressure Vessel Safety (TSASK) has authority over inter-connecting piping, pressure equipment, and construction activities. For more information on TSASK, please visit the website: www.tsask.ca

Prior to approval, a facility may also need to be reviewed through the Environmental Assessment review process. Contact the Environmental Assessment & Stewardship branch at 306-787-6132 for guidance.

Lithium Well - Licensing and Drilling Requirements

A designated lithium well completion type is not currently available in IRIS. Lithium is produced in solution from formation water or through other production fluids. A well to be used in the production of Lithium from solution in formation water is to be licensed as a Water Source Well in IRIS.

Prior to applying for a water source well in IRIS, the Water Security Agency (WSA) must issue a permit for the water withdrawal. More information can be found at: <https://www.wsask.ca/permits-approvals/overview/>.

In addition:

- All licensing and drilling requirements must be followed for any proposed lithium wells.
- *The Oil and Gas Conservation Regulations, 2012* (OGCR), O-2 Reg 6 (Part XI), *Directive PNG004: Surface Lease Construction Requirements*, and *Directive PNG005: Casing and Cementing Requirements* must be followed regarding surface location, well control drilling activity and well integrity.
- As per OGCR Section 28(2), approvals must be obtained for any drilling deviations from proposed licensing details that occur while drilling. Contact the local field office for approvals.

- All licensed infrastructure is subject to inspection. Any non-compliance activity will be communicated in IRIS and will require a corrected response to be provided.
- A water source well does not have a drainage unit associated. Water source wells used to produce lithium will have a default association of the bottom hole legal subdivision (LSD) associated to the completion.

For further information, on requirements for obtaining a Well Drilling Licence please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/oil-and-gas-drilling-and-operations/licence-to-drill-a-well>

5. Well Operations

Spacing Modification

There are no established spacing requirements for water source wells used for lithium production. Should a licensee plan to have more than one water source well, for the purpose of lithium production within the same stratigraphy within an LSD please contact the ER Service Desk for review prior to licence/recompletion.

Changes Before Initial Completion

After a well is drilled and it is determined that a different formation is to be completed for the initial completion of the well, the local Field Office must be contacted to discuss the deviation from the licenced completion. No additional applications are then required and instead the completion can be reported as "Not Completed as Planned" in IRIS. More information on reporting the initial completion can be found at:

<https://training.saskatchewan.ca/EnergyAndResources/information-submission/#/lessons/35ILcpkMzyflf6CWGcQ0TqvbAVRHE0mZ>

Recompletions/Reclassifications

Any additional completions or reclassification of existing completions made after the initial completion must make an application for authorization to well reclassification or recompletion. These applications will be for any plugbacks or multizone completions conducted after the initial completion. For further information, visit the Well Reclassification and Completion Application page:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/well-reclassification-and-recompletion>

Well Abandonment

How to apply for authorization to abandon a well, perform a downhole abandonment, or cut and cap a well. For wells drilled for upstream oil and gas, or potash, in Saskatchewan. For more information on Well Abandonment Application, please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/well-abandonment>

Well Repair

How to apply for authorization to repair a well. For more information on the Oil and Gas Well Repair Application page, please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/application-to-repair-a-well>

6. Production Reporting

Reporting of volumetric data is required for a well or facility and must identify the activity, product, and volume. Lithium production is reported monthly through [Petrinex](https://www.petrinex.ca/) (<https://www.petrinex.ca/>). [*Directive PNG032 – Volumetric, Valuation and Infrastructure*](https://publications.saskatchewan.ca/#/products/87355) (<https://publications.saskatchewan.ca/#/products/87355>) can be used to determine what type of information is required to be reported through Petrinex.

[*Directive PNG017: Measurement Requirements for Oil and Gas Operations in Saskatchewan \(PNG017\)*](https://publications.saskatchewan.ca/#/products/105418) (<https://publications.saskatchewan.ca/#/products/105418>). PNG017 contains information on regulatory requirements with respect to measurement points used for accounting and reporting purposes, including upstream and some downstream facilities. Measurement is the volume determination which is integral for accounting and reporting activities.

- Facility measurement schematic must be created and maintained by the operator of record. Schematic must be used by operational and production accounting to ensure that reported volumes follow the regulatory requirements.
- Produced volumes must be measured by meter or estimated using acceptable methods. If meter is utilized, it must operate within prescribed limits of accuracy and uncertainties; and
- Where applicable, meter must be calibrated and proved with respect to frequencies outlined in the Directive PNG017.
- The volume of water is to be reported in cubic meters (m³), at standard conditions. (i.e. atmospheric pressure of 101.325 kPa and temperature of 15.00 degrees Celsius).

PNG032: Volumetric, Valuation and Infrastructure Reporting

Saskatchewan's oil and gas industry is required to report volumetric, valuation, royalty/taxpayer, and some infrastructure data to the government.

For more information on PNG032 page, please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-reporting-and-compliance/reporting-data-and-incidents/volumetric-valuation-and-infrastructure-reporting>

PNG013: Well Data Submission Requirements (PNG013)

Applicable sections are on a case-by-case basis. Applicability is heavily dependent on obligation determination based on well licensing and work completed.

For more information on PNG013 page, please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-reporting-and-compliance/reporting-data-and-incidents/submitting-well-data>

PNG076: Enhanced Production Audit Program (PNG076)

Enhanced Production Audit Program (EPAP) applies to all Business Associates operating facilities subject to the Ministry of Energy and Resources' measurement and reporting requirements. Still, it does not apply to mineable oil sands.

For more information on PNG076, please visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-reporting-and-compliance/enhanced-production-audit-program>

7. Royalties

Lithium produced from or allocated to Crown lands is subject to Crown royalty. The Crown royalty for lithium production will be determined on a disposition basis.

There is currently no Crown royalty specified for Lithium, but provisions for the lithium royalty will be incorporated into *The Subsurface Mineral Royalty Regulations, 2017*. Prior to implementing the royalty in regulations, all leases issued to lithium producers will contain provisions that reserve and establish a specific royalty to the Crown. Once the amendments that

establish the royalty have been approved and filed with the Registrar of Regulations, the provisions of the regulations that establish the lithium royalty will override the royalty terms in the lease.

8. Transferable Royalty Credit Programs

[Oil and Gas Processing Investment Incentive](#) (OGPII) provides eligible value-added lithium projects with transferrable oil and gas royalty credits worth 15 per cent of eligible costs, up to a maximum of \$75 million in royalty credits per project.

[Saskatchewan Petroleum Innovation Incentive](#) (SPII) provides eligible lithium innovation commercialization projects with transferable oil and gas royalty credits worth 25 per cent of eligible costs, up to a maximum of \$5 million in royalty credits per project. The program targets a broad range of innovations deployed across all Saskatchewan's oil, gas, or helium industry segments.

A key qualifier for both OGPII and SPII include commercialization of oil and gas production by-products or waste products; if a proposed project includes lithium recovery as a by-product of oil and gas production and waste products (i.e., lithium extraction from produced water), funding through OGPII and SPII may be available.

For more information on the incentive programs, please email ogpii@gov.sk.ca or spii@gov.sk.ca.

9. Liability Management and Site Closure Requirements

Eligibility Requirements to Hold or Acquire Licenses

Before applying to (1) [transfer](#), or (2) hold a [well](#) or [facility](#) licence, licensees must:

- Meet applicable eligibility requirements to hold a well/facility licence under Section 12 of [The Oil and Gas Conservation Regulations, 2012](#).
- Have an [IRIS](#) account and the appropriate permissions assigned by your IRIS Security Administrator.
- Be registered with [Information Services Corporation \(ISC\)](#) as a corporation to carry on business in Saskatchewan.
- Be in good standing in relation to debts owing to the Crown.

Security Deposit Requirements

As a condition of a person becoming a licensee under [The Oil and Gas Conservation Act \(OGCA\)](#), Section 15 provides authority to the Minister to require the submission of a security deposit to ensure obligations with respect to the suspension, abandonment, restoration, remediation or reclamation or wells, facilities and sites are satisfied.

Environmental Site Assessment Requirements

Contaminant remediation and investigation are to be completed to the standards supplied in [Directive PNG 033: Phase II Environmental Site Assessment](#). Incident reclamation is to be completed to match the land use prior to the incident and match adjacent background conditions.

Acknowledgment of Reclamation

The Acknowledgement of Reclamation (AOR) Program administered by the Government of Saskatchewan's Ministry of Energy and Resources oversees the reclamation of all well and facility sites licensed under [The Oil and Gas Conservation Act \(OGCA\)](#).

Licensees seeking to satisfy their reclamation obligations for their sites may submit one or more of the following applications:

- [Acknowledgement of Reclamation \(AOR\)](#): For sites reclaimed in accordance with [The Oil and Gas Conservation Regulations, 2012](#).
<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/liability-management/acknowledgement-of-reclamation/application-for-acknowledgement-of-reclamation>
- [Grandfathered Reclamation Release](#): For sites that were reclaimed before the implementation of the AOR Program on June 19, 2007.
<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/liability-management/acknowledgement-of-reclamation/grandfathered-reclamation-release>
- [Exemption from Reclamation \(overlap activity\)](#): For sites where reclamation is prevented due to overlapping well or facility activities on the land area.
<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/liability-management/acknowledgement-of-reclamation/exemptions-from-reclamation-for-well-or-facility-sites-with-overlapping-activities>
- [Reclamation Declaration Application](#): For sites that have been reclaimed and establishment of vegetation is still required, licensees may be eligible for a temporary reduction in reclamation liability.

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/liability-management/acknowledgement-of-reclamation/reclamation-declaration-application>

All applications are submitted through the [Integrated Resource Information System \(IRIS\)](#).

An application to obtain an AOR authorization for a well or facility site must be submitted by the licensee. It typically takes 3 to 5 years to obtain all the documentation required for an AOR application.

For more information, see:

- [Directive PNG016: Acknowledgement of Reclamation Requirements](#)

<https://publications.saskatchewan.ca/#/products/76263>

- [Directive PNG018: Detailed Site Assessment Requirements](#)

<https://publications.saskatchewan.ca/#/products/76265>

10. The Oil and Gas Cost Recovery Levy (Administration Levy)

The Administration Levy is a single annual payment to Saskatchewan's General Revenue Fund. Well and pipeline licensees are assessed an annual levy to offset costs incurred by the Government of Saskatchewan for regulation of the oil and gas industry. For more information on the levy visit:

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-reporting-and-compliance/well-levy>

11. Confidentiality

In general, information submitted in relation to a subsurface mineral disposition is confidential until the disposition terminates or is surrendered. However, any information with respect to the Prairie Evaporite required to be submitted for a well drilled pursuant to a well licence within any subsurface disposition lands remains confidential until the earlier of five years from the finished drilling date and the expiry of the subsurface disposition. Information submitted with respect to any part of a permit that is converted to lease is deemed to have been derived from the lease.

In some instances, certain data collected in association with exploration and development activities of a well may be eligible for a one-year confidentiality period. Information on the

conditions for granting of a one-year confidentiality period can be found at:

<https://publications.saskatchewan.ca/api/v1/products/117636/formats/135111/download>

12. Further Information

Numerous papers have been published by the Saskatchewan Geological Survey on lithium potential from the brines in the province. Links are provided below:

- Investigating the Mineral Potential of Brines in Southern Saskatchewan:
<https://publications.saskatchewan.ca/#/products/82228>
- Initial Results of a Brine Sampling Project: Investigating the Mineral Potential of Brines in Southeastern Saskatchewan: <https://publications.saskatchewan.ca/#/products/80068>
- Results from the 2016 Field Season for the Brine Sampling Project: Investigating the Mineral Potential of Brines in Saskatchewan:
<https://publications.saskatchewan.ca/#/products/86453>
- Investigating the Mineral Potential of Brines in Saskatchewan: Results from the 2017 Field Season for the Brine Sampling Project:
<https://publications.saskatchewan.ca/#/products/89715>
- Investigating the Mineral Potential of Brines in Saskatchewan: New Results from the Brine Sampling Project for 2018: <https://publications.saskatchewan.ca/#/products/100657>

A public database with full chemistry data for all samples collected by the survey can be found at: <https://publications.saskatchewan.ca/#/products/79894>.